

(FILE 'HOME' ENTERED AT 11:16:34 ON 26 JUN 2003)

FILE 'MEDLINE, AGRICOLA, CANCERLIT, SCISEARCH, CAPLUS, MEDICONF' ENTERED
AT 11:16:44 ON 26 JUN 2003

L1 62 S (TIAP OR XIAP) (L) ANTIBOD?
L2 21 DUP REM L1 (41 DUPLICATES REMOVED)
L3 21 FOCUS L2 1-
L4 0 S L3 AND PY<=1998
L5 7 S (BIR DOMAIN) (L) ANTIBOD?
L6 5 DUP REM L5 (2 DUPLICATES REMOVED)
L7 25 S ANTI-IAP ANTIBODY
L8 12 DUP REM L7 (13 DUPLICATES REMOVED)
L9 12 SORT L8 PY
L10 35 S (INHIBITOR OF APOPTOSIS PROTEINS) (L) ANTIBOD?
L11 18 DUP REM L10 (17 DUPLICATES REMOVED)
L12 18 SORT L11 PY
L13 91 S (INHIBITOR OF APOPTOSIS PROTEINS) (L) BIND?
L14 41 DUP REM L13 (50 DUPLICATES REMOVED)
L15 4 S L14 AND PY<=1998
L16 4 SORT L15 PY
L17 26 S TIAP (L) APOPTOSIS
L18 12 DUP REM L17 (14 DUPLICATES REMOVED)
L19 12 SORT L18 PY

=> d an ti so au ab pi l19 7 6 8 4 9 1

L19 ANSWER 7 OF 12 CAPLUS COPYRIGHT 2003 ACS

AN 2001:916377 CAPLUS

DN 136:48811

TI Methods and compounds for modulating male fertility

SO U.S., 29 pp.

CODEN: USXXAM

IN Korneluk, Robert G.; Lagace, Mark

AB The invention features novel methods and reagents useful for the treatment of excessive or insufficient **apoptosis** in cells, and, particularly, in germ-line cells. The invention is useful in treating testicular cancers, cancers of germ-line cells, cancers in non-germ-line cell tissues, infertility (e.g., male infertility), and for birth control (e.g., male birth control). The invention features a substantially pure nucleic acid mol. encoding a **TIAP** (testis specific inhibitor of **apoptosis**) polypeptide. The treatment methods of the invention involve using the nucleic acid or **TIAP** polypeptide.

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6331412	B1	20011218	US 1999-239867	19990129
	US 2002086409	A1	20020704	US 2001-24433	20011218

L19 ANSWER 6 OF 12 MEDLINE

AN 2001166024 MEDLINE

TI A novel homologue of the TIAP/m-survivin gene.

SO BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, (2001 Mar 23) 282 (1) 207-11.

Journal code: 0372516. ISSN: 0006-291X.

AU Ogasawara T; Hatano M; Otaki M; Sekita N; Kobayashi K; Miyazaki M; Nakajima N; Tokuhisa T

AB The inhibitor of **apoptosis** (IAP) proteins comprise a highly conserved gene family that prevents cell death in response to a variety of stimuli. **TIAP**/m-survivin, a murine homologue of human Survivin, is a member of the IAP family. **TIAP**/m-survivin has one baculovirus IAP repeat (BIR) and lacks a C-terminal RING finger motif. Here we identified the genomic DNA region (**TIAP**-2) that is homologous to the **TIAP**/m-survivin gene by a low stringency genomic DNA hybridization. The region is on the chromosome 9 which is distinct from that (chromosome 11) of the **TIAP**/m-survivin gene, and contains DNA sequence similar to a part of the BIR and the 3' side of the **TIAP**/m-survivin gene and the sequence homology between them is 92%. Expression of **TIAP**-2 mRNA was detected in various murine tissues by RT-PCR. Although expression of **TIAP** /m-survivin mRNA is upregulated in synchronized cells at S to G2/M phase

of the cell cycle, expression of **TIAP-2** mRNA was constant in the cell cycle, suggesting the different role of **TIAP-2** from that of **TIAP/m-survivin**.
Copyright 2001 Academic Press.

L19 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2003 ACS

AN 2001:25702 CAPLUS

DN 134:96296

TI Sequences of novel internal ribosome entry sites (IRES) of human and mouse X-linked inhibitor of apoptosis (XIAP) and uses thereof in modulating cap-independent translation

SO U.S., 35 pp., Cont.-in-part of U.S. Ser. No. 121,979.

CODEN: USXXAM

IN Korneluk, Robert G.; Holcik, Martin; Liston, Peter

AB The invention features purified nucleic acid encoding a novel internal ribosome entry site (IRES) sequence from the human and mouse X-linked inhibitor of apoptosis (XIAP) gene. The invention also features methods for using the XIAP IRES to increase cap-independent translation of polypeptide coding sequences linked to the XIAP IRES, and methods for isolating compds. that modulate cap-independent translation.

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6171821	B1	20010109	US 1999-332319	19990614
US 6159709	A	20001212	US 1998-121979	19980724
CA 2336707	AA	20000203	CA 1999-2336707	19990722
WO 2000005366	A2	20000203	WO 1999-IB1415	19990722
WO 2000005366	A3	20000615		

W: CA, JP, US

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

EP 1100900 A2 20010523 EP 1999-935002 19990722

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI

L19 ANSWER 4 OF 12 CAPLUS COPYRIGHT 2003 ACS

AN 2000:84982 CAPLUS

DN 132:133245

TI An internal ribosome entry site from the X-linked inhibitor of apoptosis gene and its uses

SO PCT Int. Appl., 87 pp.

CODEN: PIXXD2

IN Korneluk, Robert G.; Holcik, Martin; Liston, Peter

AB A novel internal ribosome entry site (IRES) sequence from the X-linked inhibitor of apoptosis (XIAP) gene is identified and characterized. The invention also features methods for using the XIAP IRES to increase cap-independent translation of polypeptide coding sequences linked to the XIAP IRES, and methods for isolating compds. that modulate cap-independent translation. The IRES was identified in the very long 5'-UTR of the XIAP gene by function. Cap-independent initiation of translation from the IRES was demonstrated by resistance of expression of the downstream gene to inhibition by poliovirus protease 2A. The IRES could also mediate translation during serum starvation and the IRES also improved XIAP-mediated inhibition of apoptosis during serum starvation. The La autoantigen was shown to be involved in translation from the IRES.

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000005366	A2	20000203	WO 1999-IB1415	19990722
WO 2000005366	A3	20000615		

W: CA, JP, US

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

US 6159709	A	20001212	US 1998-121979	19980724
US 6171821	B1	20010109	US 1999-332319	19990614
CA 2336707	AA	20000203	CA 1999-2336707	19990722
EP 1100900	A2	20010523	EP 1999-935002	19990722

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI

L19 ANSWER 9 OF 12 MEDLINE

AN 2002462304 MEDLINE

TI Overexpression of TIAP/m-survivin in thymocytes enhances cell proliferation.
 SO MOLECULAR IMMUNOLOGY, (2002 Oct) 39 (5-6) 289-98.
 Journal code: 7905289. ISSN: 0161-5890.
 AU Hikita Satoshi; Hatano Masahiko; Inoue Atsushi; Sekita Nobuyuki; Kobayashi Koichi; Otaki Masayuki; Ogasawara Takeshi; Okada Seiji; Hirasawa Hiroyuki; Tokuhisa Takeshi
 AB **TIAP/m-survivin**, a member of the inhibitor of **apoptosis** (IAP) protein family, is expressed in a cell cycle dependent manner. It is strongly expressed in various subsets of thymocytes. To investigate a role of **TIAP/m-survivin** in thymocytes, mice carrying the lck-**TIAP** transgene were established. Two out of six transgenic mice expressed large amounts of **TIAP** mRNA and protein in thymocytes. Although T cell development and **apoptosis** of thymocytes were largely unaffected in lck-**TIAP** mice, transgenic thymocytes displayed hyperproliferation in response to PMA and ionomycin but not to anti-CD3 antibody. Thus, overexpression of **TIAP/m-survivin** augments cell proliferation of thymocytes to a certain stimulation.

L19 ANSWER 1 OF 12 MEDLINE
 AN 1999145571 MEDLINE
 TI Expression of a murine homologue of the inhibitor of apoptosis protein is related to cell proliferation.
 SO PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1999 Feb 16) 96 (4) 1457-62.
 Journal code: 7505876. ISSN: 0027-8424.
 AU Kobayashi K; Hatano M; Otaki M; Ogasawara T; Tokuhisa T
 AB The inhibitor of **apoptosis** (IAP) proteins form a highly conserved gene family that prevents cell death in response to a variety of stimuli. Herein we describe a newly defined murine IAP, designated **Tiap**, that proved to be a murine homologue of human survivin based on sequence comparison. **TIAP** has one baculovirus IAP repeat and lacks a C-terminal RING finger motif. **TIAP** interacted with the processed form of caspase 3 and inhibited caspase-induced cell death. Histological examinations revealed that **TIAP** is expressed in growing tissues such as thymus, testis, and intestine of adult mice and many tissues of embryos. In in vitro studies, **TIAP** was induced in splenic T cells activated with anti-CD3 antibody or Con A, and the expression of **TIAP** was up-regulated in synchronized NIH 3T3 cells at S to G2/M phase of the cell cycle. We propose that during cell proliferation, cellular protective activity may be augmented with inducible IAPs such as **TIAP**.

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L2 21 DUP REM L1 (41 DUPLICATES REMOVED)
L3 21 FOCUS L2 1-
L4 0 S L3 AND PY<=1998
L5 7 S (BIR DOMAIN) (L) ANTIBOD?
L6 5 DUP REM L5 (2 DUPLICATES REMOVED)

=> d an ti so au ab pi l6 1-5

L6 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2003 ACS

AN 2002:256459 CAPLUS

DN 136:289899

TI Use of antisense DNA to human and mouse inhibitor of apoptosis proteins as
gene therapy for cancer and other cell proliferation disorders

SO PCT Int. Appl., 135 pp.

CODEN: PIXXD2

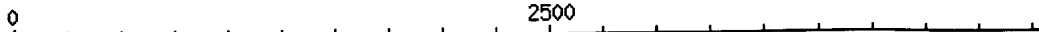
IN Korneluk, Robert G.; Lacasse, Eric; Baird, Stephen; Holcik, Martin; Young,
Sean

AB The present invention feature antisense IAP (inhibitor of apoptosis
protein) nucleic acids and other neg. regulators of the IAP anti-apoptotic
pathway, and methods for using them to enhance apoptosis. More
specifically, antisense DNA and ribozymes for inhibition of mouse and
human X-linked IAP (XIAP) and human inhibitors of apoptosis namely HIAP1
and HIAP2 are provided. The said antisense DNA are between 8 and 30
nucleotides in length. Furthermore, these antisense nucleic acids contain
at least one modified internucleotide linkage consisting of
phosphorothioate, methylphosphonate, phosphotriester, phosphorodithioate or
phosphoselenate linkages. The antisense DNA may alternatively contain a
modified sugar moiety such as a 2'-O-Me group. In a specific embodiment,
antisense DNA residues contain a core of phosphodiester DNA residues,
flanked on each side by at least 1-3 2'-O-Me RNA residues with a
phosphorothioate linkage between the flanking RNA residues. The cDNA and
protein sequences for two murine and two human IAP proteins, as well as
for murine and human X-linked IAP are also provided. Also provided are
antibodies that bind IAP proteins. Neg. regulators may also
include IAP proteins contg. a ring zinc finger domain with no more than
two **BIR domains** (baculovirus inhibitor of apoptosis
repeat). Neg. regulator of apoptosis may be an anti-IAP **antibody**
that prevents cleavage of the IAP protein. In addn., methods for treating
diseases and disorders involving apoptosis are provided using said
antisense compns. in chemotherapy.

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002026968	A2	20020404	WO 2001-CA1379	20010927
WO 2002026968	A3	20021227		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2001093583	A5	20020408	AU 2001-93583	20010927

L16 ANSWER 3 OF 4 MEDLINE
AN 1998395120 MEDLINE
TI Apoptosis induced by Drosophila reaper and grim in a human system.
Attenuation by inhibitor of apoptosis proteins (cIAPs).
SO JOURNAL OF BIOLOGICAL CHEMISTRY, (1998 Sep 11) 273 (37)
24009-15.
Journal code: 2985121R. ISSN: 0021-9258.
AU McCarthy J V; Dixit V M
AB Previous genetic studies have established Reaper and Grim as central
regulators of apoptosis in Drosophila melanogaster. Reaper and Grim
induce extensive apoptosis in Drosophila, yet share no homology to known
vertebrate proteins. In this study, we show for the first time that
ectopic expression of Reaper or Grim induced substantial apoptosis in
mammalian cells. Reaper- or Grim-induced apoptosis was inhibited by a
broad range of caspase inhibitors and by human **inhibitor of
apoptosis proteins** cIAP1 and cIAP2. Additionally, in
vivo **binding** studies demonstrated that both Reaper and Grim
physically interacted with human IAPs through a homologous 15-amino acid
N-terminal segment. Deletion of this segment from either Reaper or Grim
abolished **binding** to cIAPs. In vitro **binding**
experiments indicated that Reaper and Grim bound specifically to the BIR
domain-containing region of cIAPs as deletion of this region resulted in
loss of **binding**. The physical interaction was further confirmed
by immunolocalization. When co-expressed, Reaper or Grim co-localized
with cIAP1. However, deletion of the N-terminal 15 amino acids of Reaper
or Grim abolished co-localization with cIAP1, suggesting that this
homologous region can serve as a protein-protein interacting domain in
regulating cell death. Moreover, by virtue of this interaction, we
demonstrate that cIAPs can regulate Reaper and Grim by abrogating their
ability to activate caspases and thereby inhibit apoptosis. This is the
first function attributed to this 15-amino acid N-terminal domain that is
the only region having significant homology between these Drosophila death
inducers.

L Number	Hits	Search Text	DB	Time stamp
1	7	TIAP SAME apoptosis	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/26 11:54
7	2	TIAP SAME method.clm.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/26 11:55
13	4	TIAP .clm.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/26 11:55
19	31	(US-6133437-\$ or US-6495339-\$ or US-6472172-\$ or US-6511828-\$ or US-6187557-\$ or US-6107041-\$ or US-6228603-\$ or US-6331412-\$ or US-6300492-\$ or US-6159709-\$ or US-6171821-\$ or US-5919912-\$ or US-6087173-\$ or US-6107088-\$ or US-6156535-\$).did. or (US-20020086409-\$ or US-20020187946-\$ or US-20020160975-\$ or US-20020137028-\$ or US-20020120121-\$ or US-20020132786-\$).did. or (WO-9835693-\$ or WO-9726331-\$ or EP-892048-\$ or WO-9822131-\$ or WO-9740847-\$ or WO-9316196-\$ or WO-9612016-\$ or WO-9706255-\$).did. or (JP-11032780-\$).did. or (US-5919912-\$).did.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/26 11:56
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-	462	BIR\$5 WITH domain	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/25 12:48
-	51	(BIR\$5 WITH domain) and iap	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/26 11:52
-	29	Robert WITH KORNELUK,	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/25 12:49
-	31	(XIAP M-XIAP HIAP\$3 M-HIAP\$3) SAME BIR\$3	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/25 12:49



Query



Similar domain architectures

2 Sequences

Homo sapiens
neuronal apoptosis



RAD55

2 Sequences

Homo sapiens
Baculoviral IAP re



LRR_RI

18 Sequences

Mus musculus
Baculoviral IAP re



AAA

5 Sequences

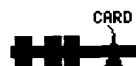
Coelomata
Baculoviral IAP re



UQ_con

3 Sequences

Eutheria
Baculoviral IAP re



CARD

9 Sequences

Murinae
Baculoviral IAP re



154 Sequences

Fungi/Metazoa grou
Baculoviral IAP re



14 Sequences

Euteleostomi
Inhibitor of apopt



RING

6 Sequences

Homo sapiens
Baculoviral IAP re



Result page: [Previous](#) [1](#) [2](#) [Next](#)

Subset by Taxonomy

Subset by selected domains:



[COG0467](#)

RecA-superfamily ATPases implicated in signal tra...

includes:

[pfam00154](#) [pfam03796](#) [COG0305](#) [COG0468](#) [COG2874](#)



[cd00162](#)

RING-finger (Really Interesting New Gene) domain,...

includes:

[smart00504](#) [smart00184](#) [COG5194](#) [pfam00097](#) [pfam04564](#)



[smart00238](#)

Baculoviral inhibition of apoptosis protein repea...

includes:

[pfam00653](#) [LOAD_bir](#) [cd00022](#)



[pfam00179](#)

Ubiquitin-conjugating enzyme. Proteins destined f...

includes:

[cd00195](#) [COG5078](#) [smart00212](#)



[cd00116](#)

Leucine-rich repeats (LRRs), ribonuclease inhibit...

includes:

[COG5238](#)



[pfam00619](#)

Caspase recruitment domain. Motif contained in pr...

includes:

[smart00114](#)



[cd00009](#)

AAA-superfamily of ATPases associated with a wide...

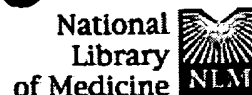
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[COG0396](#) [COG0410](#) [COG0411](#) [COG0444](#) [COG0470](#) [COG0523](#) [COG0541](#) [COG0552](#) [COG0714](#) [COG1101](#) [CO](#)
[COG1117](#) [COG1118](#) [COG1119](#) [COG1120](#) [COG1121](#) [COG1122](#) [COG1124](#) [COG1125](#) [COG1126](#) [COG1127](#) [CO](#)
[COG1134](#) [COG1135](#) [COG1136](#) [COG1137](#) [COG1221](#) [COG1222](#) [COG1223](#) [COG1466](#) [COG1474](#) [COG1485](#) [CO](#)
[COG2842](#) [COG2884](#) [COG3172](#) [COG3267](#) [COG3283](#) [COG3604](#) [COG3638](#) [COG3839](#) [COG3840](#) [COG3842](#) [CO](#)

[PubMed](#) [Nucleotide](#) [Protein](#) [Structure](#) [CDD](#) [Taxonomy](#) [Help?](#)
CD: [pfam00653.8](#), [BIR](#) **PSSM-Id:** 1211 **Source:** [Pfam\[US\]](#), [Pfam\[UK\]](#)
Description: Inhibitor of Apoptosis domain. BIR stands for 'Baculovirus Inhibitor of apoptosis protein Repeat' Also known as IAP repeat.
Taxa: [root](#) **References:** [1 PubMed Link](#) **Related:** [smart00238](#), [cd00022](#), [LOAD_bir](#)
Status: Alignment from source **Created:** 11-Apr-2003
Aligned: 42 rows **PSSM:** 66 columns **Representative:** Consensus
Proteins: [\[Click here for CDART summary of Proteins containing pfam00653\]](#)

[View 3D Structure](#) with [Cn3D](#) using [Virtual Bonds](#) (To display structure, download [Cn3D](#))
[View Alignment](#) as [Hypertext](#) width 60 color at 2.0 bits
[Subset Rows](#) up to 10 of the most diverse members

	10	20	30	40	50	60
*.....*.....*.....*.....*.....*.....					
consensus	1	RLRTFQN-----	WPISNLQF-----	PEQLAKAGFYITGVGDEV-----	33	
1E31_A	18	RISTFKN-----	WPFLEGCAC-----	tPERMAEAGFIHCPTENEPdl-----	54	
qi 1352900	153	RKFTFQDn-----	WPHSGSQNehplgIEKMVNAGLMRYDSSIEGlgdpsmdkltmn	203		
qi 1352900	20	RLRTFQDgvalekkklkWSFKVIPY-----	QAMAKLGFYFDPVIDPKtsklk-----	67		
qi 2497245	129	RRATFDH-----	WPAALNAL-----	THDIAEAGMFHTMLGDET-----	161	
qi 1170468	32	RHSSFEN-----	YPIENTAF-----	INSLIVNGFKYNQVDDHV-----	64	
qi 2497246	32	RNQSFAI-----	HGIKNY-----	EKFSNAGFFYTSPTEIT-----	61	
qi 3875145	27	RFASFKE-----	FVYDKRINia-ctSEKLARAGFYSTASPEFPas-----	65		
qi 2497244	12	RLATFGE-----	WPLNAPVS-----	AEDLVANGFFATGNWLEA-----	44	
qi 12643291	63	RLKTFVT-----	YEPYSSWI-----	PQEMAAAGFYFTGVKSGI-----	95	
	70	80	90	100	110	
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consensus	34	---RCFFCGVELKN-----	WEPGDDPWEEHKRWSP---	NCPFVR	66	
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qi 1352900	204	dtcYCIYCKQLLQG-----	WSINDDPMSRHYKVSQn-gNCYFFQ	241		
qi 1352900	68	dsvRCCYCHROTYNvrdrskrkdvLETLSNIMRQHLTVTDnkqVCLLIY	117			
qi 2497245	162	---ACFFCDRCVRD-----	WLPGDDPWQRHALANP---	QCYFVV	194	
qi 1170468	65	---VCEYCEAEIKN-----	WSEDECIEYAHVTLSP---	YCAVAN	97	
qi 2497246	62	---CYCCGMKFCN-----	WLYEKHPLQVHGFWSR---	NCGFMR	93	
qi 3875145	66	--aKCPFCMLEIN-----	FEQCDDPWEKHKSGSP---	HCEFVM	98	
qi 2497244	45	---ECHFCHVRIDR-----	WEYGDQVAERHRRSSP---	ICSMVL	77	
qi 12643291	96	---QCFC CSLILFG-----	AGLTRLPIEDHKRFHP---	DCGFLL	128	



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☐ 1: Biochem Biophys Res Commun. 2003 Jan 31;301(1):236-42.

Related Articles, Links

ELSEVIER SCIENCE

FULL-TEXT ARTICLE

Molecular cloning and characterization of a novel inhibitor of apoptosis protein from *Xenopus laevis*.**Song K, Kim TM, Kim HJ, Kim JW, Kim HH, Kwon HB, Kim WS, Choi HS.**

Hormone Research Center, Chonnam National University, Kwangju 500-757, Republic of Korea.

A novel inhibitor of apoptosis protein family member termed SIX was identified in *Xenopus* containing a single baculoviral IAP repeat (BIR) domain and no COOH-terminal RING finger domain. It exhibited striking amino acid sequence similarity with human survivin, mouse TIAP, and recently found *Xenopus* survivin, especially a part of BIR domain was highly conserved. Interestingly, SIX interacted with RXRalpha through the AF2 domain in the absence of ligand, which was weakened when the ligand was present. Northern blot analysis demonstrated that SIX mRNA was not detectable in adult with exception of the ovary and testis, and whole-mount in situ hybridization and Northern blot analyses revealed strong and homogeneous expression of SIX in the developing oocytes. In the embryos, the expression of SIX was observed in the animal hemisphere from one-cell to yolk plug stages and high level of expression was detected in the future brain and dorsal region of the neural tube at the neurula stage and early tail-bud stage. These results strongly support the fact that survivin is evolutionarily conserved in structure and SIX is likely to be the *Xenopus* counterpart of human and mouse survivin.

PMID: 12535669 [PubMed - indexed for MEDLINE]

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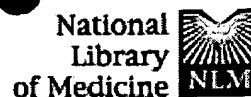


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Inhibitor of apoptosis proteins and their relatives: IAPs and other BIRPs.

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SUMMARY: Apoptosis is a physiological cell death process important for development, homeostasis and the immune defence of multicellular animals. The key effectors of apoptosis are caspases, cysteine proteases that cleave after aspartate residues. The inhibitor of apoptosis (IAP) family of proteins prevent cell death by binding to and inhibiting active caspases and are negatively regulated by IAP-binding proteins, such as the mammalian protein DIABLO/Smac. IAPs are characterized by the presence of one to three domains known as baculoviral IAP repeat (BIR) domains and many also have a RING-finger domain at their carboxyl terminus. More recently, a second group of BIR-domain-containing proteins (BIRPs) have been identified that includes the mammalian proteins Bruce and Survivin as well as BIR-containing proteins in yeasts and *Caenorhabditis elegans*. These Survivin-like BIRPs regulate cytokinesis and mitotic spindle formation. In this review, we describe the IAPs and other BIRPs, their evolutionary relationships and their subcellular and tissue localizations.

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PMID: 11516343 [PubMed - indexed for MEDLINE]